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Faculty Members' Experiences with Teaching Multimodal Courses in Higher Education

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Faculty Members' Experiences with Teaching Multi-modal Courses in Higher Education

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ABSTRACT

Higher education faculty members often devote significant time to update and redesign their courses in addition to their service and scholarly activities. While some faculty members teach only face-to-face (f2f) or online courses, others teach both courses combined in one course to not only meet students' needs but also help to increase enrollment and graduation rates. The problem addressed in this study was the inconsistent faculty load and compensation in higher education, resulting in faculty members' voluntary teaching of multimodal courses without proper compensation. The purpose of this qualitative single-case study was to explore faculty members' perceptions of their teaching experiences with dual-mode courses in higher education and identify themes that indicate what has been successful and what can be enhanced to improve faculty members' multimodal teaching experiences. Data were collected using an online questionnaire with semi-structured questions shared with the faculty members teaching at the higher education institutions across the United States through the Association of Technology, Management, and Applied Engineering (ATMAE) and LinkedIn professional network communication systems. Seventeen responses were received and then analyzed using structural and axial coding before identifying meaningful themes. The results of this study revealed innovative educational approaches conducive to diverse learners participating in courses with various modes of instruction. Most of the participants conveyed that faculty members should be compensated for the extra work either one and half times of a single-mode course or as equally as full f2f and fully online instruction. In contrast, a few participants felt that they would not need any additional pay for teaching courses in various modes. Ultimately, one of the participants felt that, given how well online classes work now, separating the program into different degree tracks, one hybrid for full-time, traditional learners, and one fully online for part-time, non-traditional learners would be a practical approach to accommodate different student demographics. Future research might encompass a broader population internationally to discover additional information regarding faculty members' teaching experiences.

INTRODUCTION

As the multimodal classroom approach has become attractive to higher education institutions in the United States, exploring faculty members' multimodal teaching experiences can help to provide a positive and rewarding educational environment for both students and instructors (Li, 2020; Malczyk, 2018; Poulin & Straut, 2016). Since the start of the fall 2020 semester, many schools and universities have been offering multimodal instruction, both face-to-face (f2f) and online, during the coronavirus pandemic with the same number of students, but dividing student groups into two or three different educational environments. More time has been spent on teaching, converting course materials, utilizing multimedia for virtual learning, and solving technical issues, which could be overwhelming for some instructors. With the current and continued advancement of online education, multimodal instruction is an approach to instruction that allows students to choose whether to participate in a traditional classroom, synchronously via video conference or asynchronously online (Malczyk, 2018; Poulin & Straut, 2016).

While some faculty members teach only traditional classrooms (f2f), some teach solely online, and some teach a combination of f2f and online courses. Recently, a new instructional method, the multimodal class format (MCF), has been developed to enhance students' learning experiences, stimulate students' motivation, and accommodate students' lifestyles (Bull, 2013; Li, 2020; Philippe et al., 2020). This method includes teaching a combination of a f2f section and an online section of the same course simultaneously as a single course in the same semester using a variety of instructional technologies.

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While the MCF enables instructors to accommodate different students' learning styles and contribute to students' success positively, the reality is that the revenues in teaching MCF courses remain the same due to having the same numbers of students but dividing them into two or three sections with different instructional modes. This class format may be suitable if one or two sections of a course have low enrollment and combining them is needed to raise the numbers above a threshold. Additionally, participating in a multimodal course may be important for students to progress towards completion and to take courses in the medium they prefer or require. There are some natural efficiencies in such a setup. For example, the same assessments, course materials and readings, syllabi, curriculum mapping, and even office hours may be used towards both sections as they are combined. However, the mediums are pedagogically quite different, requiring the faculty to teach the course in two different ways to two groups of students every week, interact with students separately via both the f2f classroom and then in online discussions, and set up and utilize different classroom spaces and electronic tools. Teaching a multimodal course may not be as much work as two distinctly different courses, but it is not merely as little as one course alone. Therefore, an increased workload for faculty is somewhere between the work of one or two courses. The outline of this study is organized into the following sections: (a) problem statement and purpose of study, (b) review of literature, (c) methodology, (d) data collection and analysis, and (e) discussion and conclusion.

Problem Statement and Purpose of Study

The problem addressed in this study was the inconsistent faculty load and compensation in higher education, resulting in faculty members' voluntary teaching of multimodal courses without proper compensation. The specific problem was that multimodal courses allow students to take courses in the format they want or need, which can increase enrollment and improve completion rates (Dang et al., 2020; Malczyk, 2018; Prescott, PharmD, & Nobel, 2019; Smith & Gordon, 2019). However, the challenge is to find the right balance of cost efficiencies to make it a win-win situation whereby the university generates additional revenue that they otherwise would not have made. The faculty member generates enough credit hours, and the workload should be reflected appropriately.

The purpose of this qualitative single-case study was to explore faculty members' perceptions of their dual-mode teaching experiences in higher education. The study identified the themes that indicate what has been successful and what can be enhanced to improve faculty members' multimodal teaching experiences considering their workload and compensation. The study gathered data from the faculty members who teach at higher education institutions across the United States and have diverse teaching backgrounds at the graduate and undergraduate academic levels.

One research question informs this study as follows: How do faculty members perceive their experiences with teaching courses in multimodalities? This paper expands the existing literature by exploring how faculty members perceive their experiences with teaching courses in multimodalities.

Problem Statement and Purpose of Study

The word 'Multimodal' is not a new term, but it has gained popularity in education for the past decades since the rapid growth of distance learning and interactive educational practices. To obtain literature relevant to the multimodal classroom approach, electronic search strategies were used. These resources were mostly obtained from academic publications of a variety of databases such as EBSCOhost, Eric, ProQuest, and SAGE. Additionally, some academic publications were found on the World Wide Web. Terms used for the literature search were multimodal courses, adult learners, multimedia learning, and flipped classroom. To review the existing literature, this section will include a theoretical/conceptual framework, the definition of multimodal education, the Importance of multimodal instruction, and the positive and negative implications of multi modalities for students, instructors, and institutions.

Theoretical/Conceptual Framework

The theory used to frame this study is the Adult Learning Theory (Andragogy), which can be an appropriate educational technique to meet the in-person as well as online students' learning needs (Knowles et al., 2014). The assumption of andragogy includes adults (a) need to know why, what, and how they learn, (b) are independent and self-directed learners, (c) learn based on their previous experiences, (d) are ready to learn when they see the relevancy to their lives or jobs, (e) are task-oriented and life-centered, and (f) are naturally motivated to learn for improving the quality of their lives (Arghode et al., 2017; Knowles et al., 2014). Learning how adults learn can help to facilitate adult education and advance educational practices such as flipped classrooms that include learning before class using a variety of instructional materials that are accessible online and working on assignments in class with the instructor's presence (Void et al., 2016). The flipped educational method can be suitable for f2f as well as hybrid courses. This method may also be appropriate for online courses that include live virtual sessions.

Incorporating the andragogy concepts into adults' educational activities may help to improve and accelerate students' learning and success (Allen & Zhong, 2016; Barr, 2016; Knowles et al., 2014). The flipped classroom that is similar to the multimodal classroom model contains adult learning theories, enables learners to participate actively in their learning process, and helps them relate to their life experiences (Void et al., 2016). For instance, planning learning activities for independent learning or team projects enables learners to explore, practice, and determine which information is useful to learn (Conrad & Donaldson, 2012). The aforementioned activities will also stimulate creativity and critical thinking, which can likewise have a positive impact on fellow learners during group projects while resulting in social and cooperative learning (Conrad & Donaldson, 2012). The instructor's task will then be guiding the self-directed learners during their learning stages, providing opportunities for practice in class, checking performance, providing constructive feedback, and making sure that students learn and can apply the new knowledge in new situations (Knowles et al., 2014; Conrad & Donaldson, 2012).

The Adult Learning Theory could be effective if all adult learners were the same. Some adult learners are independent learners whereas some may be dependent learners. When designing learning units, adult educators should not rely excessively on individual independence and consider providing opportunities for social involvement (McLean, 2015). This option can create a sense of community and a positive learning environment for observational and collaborative learning. Another part of the adult learning theory indicates that adults are intrinsically motivated to learn when they see that new knowledge can improve the quality of their lives (Allen & Zhong, 2016). This statement might be true for many cases, and research shows that using interactive learning resources that include multisensory educational activities improves students' motivation as well (Bull, 2013). Being cognizant about adult learners' characteristics and their diverse learning needs helps create a positive and productive learning environment (Conrad & Donaldson, 2012; Knowles et al. 2014). The results of this study could potentially contribute to Adult Learning Theory by exploring faculty members' experiences of the multimodal educational model.

Definition of Multimodal Education

The terms 'multimodal learning' and multimodal teaching' have similar meanings that emphasize sensory modalities. Kennedy (2019) stated, "Multimodal learning in education means teaching concepts using multiple modes. Modes are channels of information or anything that communicates meaning in some way" (para. 6). Examples of these modes could be pictures, illustrations, audio, speech, music, gestures, facial expressions, and others. According to Maier (2020), "Multimodal teaching is a style in which students learn the material through several different sensory modalities. For example, a teacher will create a lesson in which students learn through auditory and visual methods or visual and tactile methods…." (para. 1). Kennedy and Maier agreed that teachers should utilize or combine two or more multimodal learning modes to ensure students understand and retain information, and have a well-rounded educational experience (Kennedy, 2019; Maier 2020). However, in this paper, the authors focus on the term 'multimodal instruction' or 'multimodalities' that present different ways of instructional delivery, for example, face-to-face (f2f) or traditional classroom, online, and hybrid (or blended) between these two delivery modes.

The course online delivery can have a portion of synchronous and asynchronous communication such as discussion board, email, virtual chat meeting, and group file exchanges, which are effective online tools. Malczyk (2018) pointed out that multimodal instruction provides students with the autonomy to self-direct their terms of a blended course. With the constant progression of online education and the Internet connection expansion, especially during this coronavirus pandemic, the trend of multimodal instruction is increasing in all levels of schools and universities. Compared to traditional face-to-face courses, several studies have confirmed the validity of online and blended learning options related to student learning outcomes (Bernard et al., 2014; Means et al., 2013; Means et al., 2009).

With the convenience and flexibility of distance learning, many students are often taking a combination of online and f2f courses. Poulin and Straut (2016) presented that "It is estimated that more than one in every four college students enrolls in at least one online course every semester" (Malczyk, 2018, p.17). Each modality, traditional f2f classroom, online, and hybrid (or blended) has its strengths and weaknesses containing major topics on modern technology and technical support, personal interaction with course instructors, meaningful connection with classmates, convenience and flexibility, high demand on instructor's workload, engagement and motivation. There are some key reasons that blended courses are preferred including:

• Equal learning outcomes with increased flexibility (Bower et al., 2015);

• Improved autonomy, reflection, and research skills; reduced student withdrawal rate; ability to foster a professional learning environment; and potential cost and resource savings (Poon, 2013).

• Personal concerns about taking fully online classes (Sherrill & Truong, 2010).

• Synchronous or asynchronous interactions with professors and classmates while having the flexibility of preferred place and time (Malczyk, 2018

5P [illegible]

Research Methodology and Design

After reviewing different types of qualitative and quantitative research methods and designs, a qualitative method with a case study design was chosen to explore faculty members' experiences with teaching multimodal courses in higher education. A qualitative research method was chosen for this study since qualitative studies are suitable for exploring individuals' experiences and feelings, they can be conducted with a small sample size, and qualitative data include textual data that can thematically be analyzed (Yates & Leggett, 2016; Yin, 2014). Quantitative research, however, includes a large sample size and quantitative data includes numerical data that can statistically be analyzed (Leedy & Omrad, 2014; Quick & Hall, 2015). Therefore, a qualitative research method was suitable for this study to explore a small sample size of faculty members' insights into multimodal teaching experiences and discover how to improve their teaching experiences considering their workload and compensation. To respond to the purpose of this study, a case study research design was chosen since the focus of this study was exploring participants' multimodal teaching experiences, and the population of this study included faculty members who had taught courses in various modes. Besides, this study included studying a "how" question, and qualitative case studies are suitable for answering "how" and "what" questions (Leedy & Omrod, 2014; Yates & Leggett, 2016; Yin, 2014).

The population of this study included graduate and undergraduate faculty members who teach at higher education institutions across the United States and are members of the Association of Technology, Management, and Applied Engineering (ATMAE) and LinkedIn. The reason for choosing this population was that they were a group of educators involved in college courses taught in multimodalities. Exploring faculty members' feedback on teaching multiple modes of instruction simultaneously could help to discover how to improve their teaching experiences, workload, and compensation.

Before conducting this study, the authors created an online questionnaire via Google Forms, which was validated by a group of college professors and instructional designers at the research site, and then submitted it to the Institutional Review Board (IRB) for approval. After obtaining approval from the IRB, the authors launched the survey link to the target population. After eight weeks of data collection, seventeen responses were received, and the saturation point was achieved. The saturation point is reached when adequate information is obtained to repeat the study, when no additional information can be collected, and when additional coding is no longer possible (Fush & Ness, 2015). For triangulation, the authors collaboratively reviewed the responses multiple times for an accurate interpretation. Additionally, to organize the participants' responses and automatically find the themes in addition to manually-discovered themes, a qualitative data analysis software, NVivo 12 Plus was utilized (Min, Anderson, & Chen, 2017). The authors then gathered and analyzed the data using an Excel Spreadsheet, created data tables and graphs for the result presentation. Note that a sample of faculty that are members of ATMAE and LinkedIn may not be a representative sample of all graduate and undergraduate faculty in the United States who have had experience in f2f and online teaching. This sample was an appropriate segment of faculty that qualified for this study.

Data Analysis and Results

The Partial Least Squares (PLS) method, using SmartPLS (SmartPLS [Version 2.0], n.d.), was used for conducting data analysis to measure employee intentions to use the KaiNexus technology. PLS is a Structural Equation Model (SEM) largely used for technology adoption studies due to its ability to evaluate the measurement model and the structural model related to the constructs. PLS has fewer restrictions on scales, sample sizes, and residual distribution (Chin, 1998). The PLS model analysis and interpretation was done in two stages: (1) assessment of the measurement model by evaluating the reliability and validity of the items measuring each construct, and (2) evaluation of SEM. This method was adopted to first establish reliability and validity of the model before drawing conclusions about construct relationships.

For the direct effects model, which measured the effects of PE, SI, EE, and FC on behavioral intentions (BI), composite reliability scores of all constructs exceeded 0.8 which exceeds the recommended threshold value of 0.7 (Nunnally, 1978), as shown in Table 1. Composite reliability data indicate that the measures were robust with regards to internal consistency. Average Variance Extracted (AVE) and construct correlations measured discriminant validity. AVE for each measure exceeded 0.5, and the square root of AVE exceeded the off-diagonal construct correlations, consistent with the guidelines of Fornell & Lacker (1981) as seen in Table 1. This outcome satisfies the discriminant validity of the model.

Table 1: Composite Reliability, AVE, and Discriminant Validity of the Constructs

	Composite Reliability	AVE	PE	EE	SI	FC	BI
Performance Expectancy (PE)	0.94	0.79	**0.89**				
Effort Expectancy (EE)	0.96	0.83	0.64	**0.91**			
Social Influence (SI)	0.91	0.72	0.62	0.55	**0.85**		
Facilitating Condition (FC)	0.91	0.70	0.49	0.74	0.48	**0.82**	
Behavior Intention (BI)	0.97	0.91	0.83	0.63	0.62	0.51	**0.95**

*The square root of AVE is shown in diagonal.

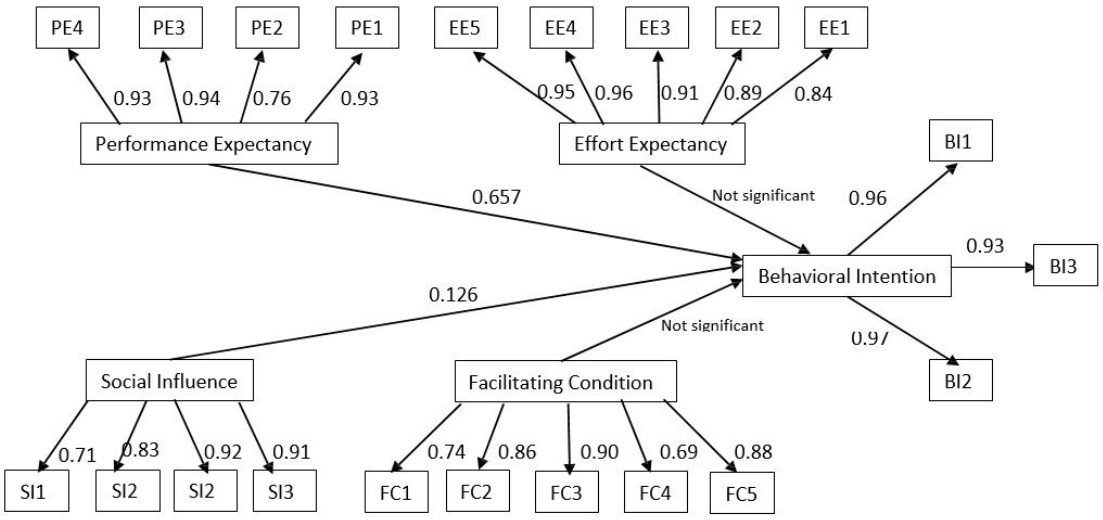
Factor loading provides information on convergent validity. The results show that factor loading on all the items was ≥ 0.7 (factors with lower factor loading values were dropped, and the model was reanalyzed), higher than the threshold value of 0.5 and higher than the cross-loadings (Peterson, 2000) as shown in Table 2. All the loadings were statistically significant, indicating non-chance relationships with the factors (Peterson, 2000).

Table 2: Factor Loading Matrix

	PE	EE	SI	FC	BI
PE1	0.93				
PE2	0.76				
PE3	0.94				
PE4	0.93				
EE1		0.84			
EE2		0.89			
EE3		0.91			
EE4		0.96			
EE5		0.95			
SI1			0.71		
SI2			0.83		
SI3			0.92		
SI4			0.91		
FC1				0.74	
FC2				0.86	
FC3				0.90	
FC4				0.70	
FC5				0.88	
BI1					0.96
BI2					0.97
BI3					0.93

The above results provide a good degree of reliability and discriminant and convergent validities. Statistical significance of the path coefficients for the direct effects model was assessed by a running the bootstrap procedure using 500 resamples in SmartPLS (SmartPLS [Version 2.0], n.d.). Figure 3 indicates that performance expectancy ($\beta = 0.66$, $p < 0.05$) and social influence ($\beta = 0.12$, $p < 0.05$) had a direct positive impact on the behavioral intentions of the employees using KaiNexus ($R2 = 0.72$). The effect of effort expectancy and facilitating conditions on employee behavioral intentions was not statistically significant at the 0.05 level.

Figure 3: Structure model result



DISCUSSION AND CONCLUSION

The objective of this research was to study employee intentions towards the use of an Electronic Suggestion System (ESS)—KaiNexus—to recommend suggestions for process improvement at the workplace. The UTAUT model proposed by Venkatesh et al. (2003) was applied to analyze employee intentions concerning the use of KaiNexus. The results show, performance expectancy and social influence had a significant positive influence on the behavioral intentions of MGMC health care employees with regards to the use of KaiNexus. Effort expectancy and facilitating conditions, however, did not have a significant influence on employee behavioral intentions.

Performance expectancy had the strongest effect on employee behavioral intentions among all the major determinants. This outcome can be attributed to a strong belief among MGMC employees that using the KaiNexus software would help improve their performance. This result is consistent with previous studies that found performance expectancy had a strong effect on behavioral intentions (Venkatesh et al., 2003; Chang et al., 2007; Yi et al., 2006). Prior studies on the adoption of healthcare robots also found that employee behavioral intentions with regards to home health care robots was significantly affected by performance expectancy (Alaiad & Zhou, 2014). The findings of this study truly reflect the participation motivation among MGMC employees to use KaiNexus for initiating process improvement.

Departmental leaders at MGMC motivated employees to engage in process improvement. This culture of improvement at MGMC focused employee intentions towards improving their daily processes. MGMC employees found KaiNexus useful because they could submit their suggestions and track their implementation, which helped make their jobs efficient. KaiNexus helped in facilitating improvement in a short time and allowed employees to observe and track the process. When employees saw their suggestions positively impacting the organization and increasing their job efficiency, they were even more motivated to use the KaiNexus platform for submitting ideas.

Facilitating conditions and effort expectancy did not have a significant influence on the behavioral intentions of the health care employees concerning the use of KaiNexus. In MGMC, 69.4 % of healthcare employees had more than five-years of experience in the healthcare sector and 43.6 % had bachelor's degrees. Thirty-four percent of the employees were aged between 45–54 years. The percentage of employees who received training on KaiNexus was 75.6 %. These figures imply that since most of the employees were computer literate, they found KaiNexus easy to work with. Further, the results on facilitating conditions revealed that the employees did not run into problems while logging suggestions on the KaiNexus platform, thus, negating the need for technical assistance. Therefore, facilitating conditions

was not a significant contributor to the behavioral intentions of MGMC's health care employees. This result contrasts with the findings of Venkatesh et al., (2003), Chang et al., (2007), and Yi et al., (2006), all of whom reported that facilitating conditions of technology affected employee behavioral intentions.

Due to ease of use of the KaiNexus software platform and the employees' prior knowledge and experience using other software, they did not find the submission of suggestions to be time consuming. As a result, effort expectancy did not have a significant positive impact on employee intentions to use KaiNexus.

Social influence had a significant positive influence on the behavioral intentions of the employees concerning KaiNexus. This result is similar to that of Ifinedo (2012), who found that usage behavior was significantly affected by social influence. MGMC employees depended on their peers' opinions when using ESS technology. The MGMC management also significantly influenced employees to submit their suggestions for continuous improvement via KaiNexus. Each employee was rewarded $10 when the suggestion they submitted on KaiNexus was implemented. To establish that no suggestion was considered inconsequential by the management, the reward amount remained fixed.

Findings of this study contribute to the body of research informing lean implementation in the healthcare sector and enhancing the quality of healthcare by increasing employee participation via software tools such as KaiNexus. These findings provide valuable information for KaiNexus service providers and administration in healthcare organizations for the successful implementation and accelerated adoption of technology which will help with process improvement among end users in the context of developed countries such as the United States.

PRACTICAL IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH

The health care industry has significantly higher costs resulting from process waste. Improvement of those processes is important; however, before initiating the process of improvement, it is vital to understand the aspects in need of improvement. Often employees handling these processes on a daily basis are in the best position to recommend suggestions for improvements. More often than not, employee voices are not leveraged due to the lack of proper channels for suggestions, lack of management motivation, and lack of employee interest. The use of KaiNexus at MGMC is a perfect example of how improvement in the organization can be driven by employee beliefs concerning their ability to contribute to process improvement via recommendation platforms. Thus, the provision of suggestion platforms (ESS, KaiNexus) to garner employee opinions and the subsequent implementation of valuable recommendations by the organization form the basis of process improvement. Such a mutual partnership between employees and upper management boosts employee morale and job satisfaction in addition to increasing customer satisfaction. MGMC utilized lean techniques to institute process improvements, and tying process improvement to employee feedback has had a significant impact on the satisfaction levels of physicians, patients, and employees.

Our analysis suggests that users find KaiNexus helpful in improving their job performance and are motivated to make improvements in their daily tasks. Performance expectancy is affected by access to resources; hence, MGMC ensured that all employees had access to a computer to provide feedback. They placed a few spare computers in common areas where employees could easily log on to KaiNexus. As KaiNexus enabled transparency through the tracking of idea implementation, employees were more motivated to provide suggestions. Performance expectancy is impacted by trust in the system and support from supervisors. MGMC trained department leaders and encouraged them to use KaiNexus, thus stimulating a culture of improvement within the department and motivating employees to use KaiNexus.

Recognizing the importance of social influence, we suggested the establishment of a role-model system to identify KaiNexus champions and highlight their stories in the monthly newspaper. MGMC adopted this suggestion devoting a section of the monthly newspaper to providing a headshot of the spotlighted employee along with a brief story of the suggestion and implementation process and a link to KaiNexus where that change could be tracked. Each month, two such stories are highlighted, and efforts are made to ensure that the stories highlighted feature not only savings in terms of money, but also cus-

tomer satisfaction and time savings. By highlighting all forms of improvement, MGMC is encouraging employees to think about suggestions on a variety of fronts. Now, MGMC has begun training leaders of departments that have yet to employ KaiNexus.

The relatively small sample size (N = 268) may be justified in terms of the response rate (22%). Results may still be subject to self-selection bias, and participating employees may have preconceived notions regarding the purpose and utility of both the technology and the study. We caution against generalizing the findings beyond the site studied as substantial differences likely exist between sites. Future work could focus on the effects of moderating variables such as age, gender, education level, and experience on employee intentions to use technology. Furthermore, three-way interactions among age, gender, and experience could also be studied. Trust with technology can significantly impact user intentions in terms of technology adoption; hence, future studies should also attempt to factor in this information.

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